CLASSIFICATION OF OCCUPATIONS.

THE CLASSIFICATION OF OCCUPATIONS, WITH SPECIAL REFERENCE TO THE UNITED STATES AND THE PROPOSED NEW CLASSIFICATION FOR THE THIRTEENTH CENSUS REPORT ON OCCUPATIONS.

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I. PAST ATTITUDE TOWARD OCCUPATION STATISTICS.

Until the last few decades the attitude of the leading nations toward occupation statistics has been one of neglect. While England and Wales began taking censuses of occupations in 1801, the United States in 1820, and Belgium in 1846, many of the other nations did not begin to perform this important social service until after the middle of the last century. Except in England and Wales, it was well past the middle of the century before anything important was done in the way of classifying occupations for census purposes; and the century was nearing its close before any of the national censuses of occupations could be said to be fairly reliable. The idea that not much could be made of occupation statistics prevailed quite generally. Then, too, with commercialism as an ideal, attention was centered on the *product* and not on the *producers*. As a result of this attitude, while national statistics of manufactures, of commerce, and of trade were being developed rapidly, statistics of occupations remained unsatisfactory, they were poorly classified and poorly reported, and they gave little aid to students of social and social-economic problems.

This attitude toward occupation statistics and their classification was unfortunate, for no statistics are more important than statistics of occupation. The *raison d'être* of all statistics is to aid man in his study of man and man's environment; and the ultimate purpose of all statistics is to better the social and economic condition of man. Our ultimate concern is not whether we are producing more corn and wheat, or increasing our exports to foreign countries, or building more miles of

railroad; but whether we are producing better, and healthier and happier farmers, and sailors, and railroad laborers. In other words, our ultimate concern is not about the *product* and its *quantity*, but about the *producers* and their *quality*. Whether the changes in production, distribution, and exchange, suggested or dictated by our statistics of manufacturers, of transportation, and of trade, have been successful, can be determined, finally, only by recourse to social statistics—to the statistics which measure the social and economic status of the workers. Therefore, no statistics have a better reason for existing and for claiming our attention than statistics of occupation, for occupation is the best single criterion of a man's social and economic status.

Whether the problem under consideration be one of those which affect mainly the working classes—the problems of child labor, woman labor, accident risks and indemnities, insurance benefits, labor legislation, etc.—or whether it be one of those which affect society at large—the problems of health, intemperance, morality, crime, pauperism, marriage and divorce, immigration, the negro question, etc.—its solution necessitates a careful consideration of occupations. For example, in the study of the problem of immigration we desire to know not only into what industries the immigrants go, but also what positions they take in these industries—whether they are at the bottom, or at the top, or midway between. And the children of the immigrants—do they enter the same industries as their parents, and the same occupations, or do they enter higher industries, or higher occupations in the same industries?

Certain inherent difficulties make absolutely accurate occupation statistics impossible. Apart from the difficulties common to all census inquiries—such as that of securing, training, and supervising a perfectly efficient body of enumerators, and that of securing absolutely accurate statements from persons who are ignorant, indifferent, or not trained in making accurate statement—there are two which arise from the nature of the inquiry. They are:

(1) The impossibility of making a classification of occupations sufficiently broad and sufficiently detailed to cover all

the various activities of the millions of gainful workers in a country with a great diversification of industries and with minute division of labor in each industry.

(2) The impossibility of classifying with complete accuracy occupations which in reality are not clear-cut and well defined. Formerly, under the guild system, to a large degree each man had a definite occupation or trade, as, cooper, tailor, shoemaker, etc.; but with the transition to the factory system and the great division of labor which accompanies it, the tendency has been for each of these old handicraft trades to give place to a number of specific processes in the manufacture of the same article. The transition is still in progress, so that, today, a workman may make the whole of an article, or perform several of the processes in its manufacture, or only one of them. Moreover, the nature of the processes is changing continually. This indefiniteness in certain occupations makes their accurate return and classification impossible; and this indefiniteness will remain so long as new processes in manufacturing are being devised.

While the inherent difficulties of enumeration are greater for occupation statistics than for most other census statistics, and while the inherent difficulties of classification are greater than for most of the others, very similar difficulties are met with in the classification of manufactures—the difficulties due to the great complexity of modern industrial establishments and processes. We may conclude, then, that, although there are certain inherent difficulties in the way of securing their absolute accuracy, the attitude that not much can be made of occupation statistics is wrong, and that, were the non-inherent difficulties eliminated, and were the same care and study given to these as has been given to statistics of manufactures and trade, they would become sufficiently accurate for most practical purposes.

In recent years, a change in the attitude toward occupation statistics has been taking place—a change due partly to the growing interest in statistics in general, but, mainly, to the increased interest in social problems and in their statistical measurement. Students of social problems have come to see that the statistics which inform them as to the actual life conditions of one half of the population for one third of each

working day, and which give them a fairly reliable index to their life conditions for the balance of the time—as well as giving them a fairly reliable index to the life conditions of those dependent upon this one half—are far too important to be neglected. But the very effort to utilize such statistics more fully has shown that they are deficient in quantity, too often are defective in quality, and seldom are classified in any satisfactory manner.

II. Proper Basis for Classifying Occupations.

The value of occupation statistics in the study of social problems is dependent very largely upon the form in which the occupations are classified. Therefore, the basis of classification is of prime importance. However, the proper basis can be determined only when we have clearly in mind the purpose of occupation statistics.

It should be the purpose of statistics of occupation and their analysis to give a vivid picture of the occupational position of each and every worker. With this end in view, they should show, so far as possible, not only the skill and intelligence of the worker, and his position in the industry, as employer, employee, or working on his own account, but, as a means for the study of the risk, healthfulness, and numerous other problems connected with his occupation, they should show, also, the specific services rendered, work done, or processes performed by him.

Therefore, occupations should be classified with respect to the kind of work done or the character of the service rendered, rather than according to the article made or worked upon, or the place where the work was done. The worker and his work should be their basis, and not the industry and its product. The industry and its product have no place in an occupation classification, except as they are aids in showing more clearly and exactly the occupational positions of the different workers. As such aids, they do perform an important service, but they should never be made the *basis* of the classification.

It is very important that the distinction between the purposes of occupation and industrial censuses, respectively, be kept clear. The purpose of a census of occupations is to show

the *kind of labor*, while, in a census of industries, the purpose is to show the *result of the labor*. The one is concerned with the *workers*, the other with their *product*. *Occupation statistics* should show individuals according to their personal occupations, without any *special* consideration of the industries in which they carry on their occupations. The division of individuals by industries is a matter of *industrial statistics*. Moreover, occupation statistics should not duplicate the statistics of manufactures, agriculture, mining, etc., but should supplement them and be supplemented by them.

III. Occupation Classification in Europe.

No foreign classification examined * measures up to this ideal. In the censuses of the leading nations of Europe, the classification of occupations has been according to an industrial rather than a personal or occupational form. Persons in the same industry have been classed together, rather than the persons who followed the same occupation. It is true that usually there is a subdivision of the personnel of each industry, according to position in the industry as employers, employees, working on own account, etc., and that, in a few countries, there is a further subdivision of the personnel of each industry into a few large occupational groups or strata, as proprietary, supervisory, clerical, etc., but in no classification studied is there any attempt to classify all the workers in each industry according to their respective specific occupations. Thus, these censuses have not been strictly censuses of occupations, but rather combinations of occupational and industrial censuses.

In the classification of the occupations in public, professional, and domestic and personal service—the non-industrial occupations—the foreign classifications are at their best, and, in some cases, the classification of these occupations is quite satisfactory. This seems to be due, however, rather more to the ease with which such occupations can be classified than to the merits of the classifications followed. The proper classification of the industrial occupations, especially those in manufacturing and mechanical industries, is most difficult, and every classification of occupations shows its strength or

* Those of England and Wales, France, Germany, Austria, Belgium, Switzerland, and Italy.

weakness at this point. Therefore, in the preceding and in the following criticisms of European classifications reference is made mainly to the classification of industrial occupations.

In the census of England and Wales (1901) the service occupations are well classified, and, in general, the classification of commercial occupations is not objectionable. However, we find here these composite groups: "Bankers; Bank Officials, Clerks"; "Insurance Officials and Clerks"; "Railway Officials or Clerks"; and "Telegraph, Telephone-Service." Under "Mines," the 640,989 coal mine operatives are divided into only three groups, and there is no division of the 789 workers in copper mines, or of the 6,577 tin miners, or of the 4,375 lead miners. Under "Metals, Machines, Implements, and Conveyances," only the followers of skilled occupations are reported separately under their respective specific occupations. The other workers are reported under such inclusive headings as, "Pig-Iron Manufacture (Blast Furnaces)" (12,-742); "Puddling Furnaces and Rolling Mills" (42,422); "Steel Smelting and Founding" (30,738); "Tinplate Manufacture" (13,048); "Lead Manufacture" (1,363); "Nail Manufacture" (3,163); "Stove, Grate, Range, Fire Iron-Makers" (5,989); "Tinplate Goods Makers" (22,100); "Cycle and Motor Manufacture" (28,537). The workers in the glass industry are divided as follows: "Sheet, Plate-Glass Manufacture" (5,257); "Glass Bottle Manufacture" (10,591); "Other Workers in Glass Manufacture" (11,870). "Paper Manufacture" is the designaton for the occupations of 15,359 workers. While, under "Textile Fabrics," the classification of the cotton workers, the wool and worsted workers, and the silk workers is fairly good, there is no division according to occupation of the 6,881 "Rope, Twine, Cord-Makers," or of the 13,893 persons engaged in "Hosiery Manufacture," or of the 12,632 persons engaged in "Lace Manufacture," or of the 7,150 persons engaged in "Carpet, Rug, Felt, Manufacture." There are 174,806 "Boot, Shoe-Makers," and 119,515 "Tailors."

Although the workers in each of the above groups are subdivided, according to position in the industry, into "Working at Home," "Employers," "Working for Employers," "Working on own Account," and "Others or no Statement," it is

very evident, that, in general, specific occupations are not given, and that, on the whole, the classification of England and Wales is industrial and not occupational in form.

In the census of France of 1906 there is an utter confusion of *products* and *producers*. While in many cases specific occupations are given, in the majority of cases only the industry in which the person works, or the name of the article he produces, is given. Examples are: "Biere" (22,861); "Boulangerie" (174,165); "Papier" (27,306); "Lingerie" (132,052); "Chaussures" (192,934); "Meubles" (55,828); "Cuivre" (4,984); "Plomb" (706); "Zinc" (2,932); "Vélocipèdes" (15,898); "Automobiles" (21,670); "Porcelaine" (12,222); "Bouteilles de verre" (15,964). In the long list of subdivisions, for each of which separate figures are given, probably there are more than 2,000 names of industries, and occupations, and articles—all curiously intermingled. The workers in each of these subdivisions are further subdivided, according to position in the industry, into "Chefs," "Employés," "Ouvriers," "Employés et Ouvriers sans Emploi," and "Isoles." Notwithstanding the large number of subdivisions in the French classification the articles worked upon have stood for the workers too generally for it to be called a classification according to occupations.

The meritorious forms for classifying occupations for general census purposes may be put into two groups. In the first group belong the different schemes for classifying workers in detail, each according to his specific occupation. In the second group belong the different schemes for dividing workers into occupational groups or strata, according to skill or according to some other occupational feature, which those to be put into each respective group are supposed to possess in common.

Each of these two forms for classifying occupations—the detailed occupational form, and the group form—has its merits and its defects. The chief merits of the group form over the detailed occupational form are: (1) The greater ease with which the numerous, and often indefinite, occupation returns can be classified into a few large groups than into many specific occupations; (2) the probable greater reliability of the resulting group figures, since the fewer the lines of division the less the chance of putting an occupation into the

wrong class; (3) the greater ease with which the figures for a few large occupation groups can be reported, than can the figures for numerous specific occupations; (4) the greater convenience of the group form of statistics in the study of social questions involving only the consideration of broad occupational groups or strata.

The German probably is the best example of the group form of occupation classification. In the German census of 1907 this form is highly developed—so well developed, in fact, that it is very doubtful whether any other classification now in use equals it. Category "B," which includes the manufacturing, mining, and building industries, is divided into 165 divisions; and each of these divisions is further subdivided into as many of the following 10 groups as are applicable:

1. Proprietors and partners.
2. Lease-holders.
3. Superintendents.
4. Contractors who carry on industries in their own dwellings for others.
5. Technically trained officials.
6. Foremen and overseers.
7. Clerical persons—bookkeepers, copyists, etc.
8. Members of the proprietor's family who are engaged in his business as helpers.
9. Skilled occupations for which as a rule apprenticeships are necessary.
10. Other helpers and handworkers for whose occupations apprenticeships usually are not necessary.

While the German classification is an excellent example of the group form, and while from many standpoints it is quite satisfactory, it is defective in that it does not serve all the purposes a national census of occupations should serve. It would be deficient as an aid in any study in which it would be necessary to consider specific occupations in detail. Group 8, above, is not a division according to occupation, but according to social status or blood relationship. In fact every person included in this group must, occupationally, belong in one or another of the other groups. Each of the groups 9 and 10 is too inclusive for the work conditions of the persons included to be the same, and in each the classification is according to skill

rather than according to occupations. Thus, the German classification is unsatisfactory as a group classification according either to skill or to the similarity of the work conditions of the members of each respective group.

The classifications of Austria and Belgium follow the same group form as does the German classification; but neither of them is so well developed a type of this form. Category "B" of the Austrian census of 1900, including the mining, manufacturing, and building industries, is divided into 112 groups, and each of these groups is further subdivided as follows:

1. Proprietary.
2. Supervisory, scientific, technical, and clerical.
3. Workers or operatives (except day wage workers).
4. Day wage workers and laborers not otherwise specified.
5. Members of the proprietor's family who are helping him in his business.

Except for this general grouping, the Austrian classification is almost entirely industrial; and, although in some cases specific occupations or trades are given, in general, for industries such as "Schiffbau," "Maschinen, Werkzeuge, Apparate," and "Glasfabrikation," the above are the only subdivisions of the workers.

In the Belgian census of 1900 there are about 150 subdivisions under mining, manufacturing and building. Each of these subdivisions is further subdivided as follows:

1. Masters.
2. Technical employees.
3. Supervisory persons.
4. Operatives.

Except for this grouping, the classification of the personnel of industrial establishments is mainly industrial. A very large proportion of the stub lines begin with "Fabrication de ———," Confection de ———," or "Préparation de ———;" and, usually, all the "ouvriers" of an industry are lumped together, without regard to differences in skill, work conditions, etc. The following are examples:

"Exploitation des mines de houille" (ouvriers, 138,576);

"Industries metallurgiques ayant pour object la fabrication ou le traitement du plomb, du cuivre, du zinc, du nickel, des métaux précieux, etc." (ouvriers, 12,081);

"Fabrication et réparation de dentelles" (ouvriers, 61,553); "Confection d'articles de tailleur, de tailleuse, de giletier et de costumier" (ouvriers, 90,190).

In the Swiss census of 1900, the industrial form of classification is followed completely.* There are 165 divisions under mining, manufacturing, and building, and each of these divisions is the name of an industry. The personnel of each industry is further subdivided, according to position in the industry, as follows:

1. Persons working on their own account.
2. Supervisory, technical, and clerical persons.
3. Operatives whose occupations are peculiar to the industry.
4. Operatives whose occupations are not peculiar to the industry.
5. Helpers and "personnel subalterne."
6. Apprentices.
7. Not specified.

Since the Swiss "Bureau de Statistique" has frankly acknowledged the defects of its classification† and pointed out the superior merits of a classification showing both the specific occupations of the workers and the industries in which they are employed, and since it has recognized the necessity of greater occupation detail at its next census, further criticism here is unnecessary.

In the Italian census of 1901, we have an attempt to classify workers according to their specific occupations. The scheme for an international classification which was approved by the International Institute of Statistics at its Christiania session was followed, after being modified slightly in order to make possible comparisons with the two preceding Italian censuses.‡ There are 166 divisions under mining and quarrying, manu-

* "Conformément au procédé adopté pour les recensements précédents, la distinction des professions n'a pas eu lieu suivant le genre particulier de *travail personnel*, mais avant tout d'après le *but industriel* de l'entreprise."—Recensement Fédéral, Troisième Volume, p. 7.

† "Il est à peine besoin de faire remarquer avec quelques détails que, pour connaître une population, la double distinction des individus selon le genre d'occupation et selon le but et les produits du travail a une valeur réelle et toute particulière. La distinction etablie d'après la nature de l'occupation permet mieux de reconnaître et d'étudier l'influence des diverses professions sur la mortalité au sein de la population; d'un autre côté, la distinction établie d'après le but de l'occupation et de la branche de l'entreprise se prête mieux à la solution des questions de législation industrielle, etc.; c'est pourquoi nous reconnaissons déjà ici la nécessité qu'il y aura, lors du prochain dénombrement, à recenser la profession personnelle de l'ouvrier à côté de celle de l'employeur."—*Ibid*, p. 8.

‡ Census of Italy, 1901, Vol. V, p. lxxv.

facturing and building. The workers included in each of these groups are further subdivided, according to position in the industry, as follows:

1. Masters and directors of establishments or operations, and artisans working on their own account or for others.
2. Clerks, bookkeepers, accountants, messenger boys, etc.
3. Technical employees, factory operatives, and day laborers.
4. Independent artisans in the textile industry.

It is hardly necessary to call attention to the composite character of group 3 above, or to the large percentage of the personnel of an industry which must be reported under this head, or to the great diversity in the skill of the persons included, or to the probable great differences in the conditions under which they work.

While the Director General of Statistics has given us evidence* that he has the proper idea as to what a census of occupations should show—the *kind of labor*, rather than the *kind of product*—an examination of the report will show that he has not been successful in carrying out this idea. Of the 166 divisions under mining and quarrying, manufacturing, and building, only about one in three can be construed as being names of occupations. Many of them begin with "Fabbricanti di ———," and fully two thirds of them can more properly be called names of industries or of industrial processes than of occupations. Thus, in many cases, this is a classification according to the *material* worked upon, or the article dealt in or handled. In Italy, where hand trades are still quite prevalent, it may designate a worker's occupation sufficiently to state the material upon which he works, or the article which he deals in or handles; but in countries where the industrial organization is more highly developed, and where hand trades have very largely given place to factory production with its minute divisions of labor and processes, it is not by any means a sufficient description of a worker's occupation to state the material upon which he works, or the article he deals in or handles.

* "Infine conviene aver presente che in un censimento delle professioni, si ha riguardo al genere di lavoro, ossia al modo col quale si applicano alla produzione i singoli individui: invece, in una statistica industriale, si ha di mira piuttosto il risultato finale, ossia la specie di prodotto ottenuto."—Census of Italy, 1901, Vol. V, p. lxxvii.

IV. Bertillon's Scheme for an International Classification.

Recognition of the importance of scientifically gathered and arranged national statistics has come only with the increased study and use of statistics and of statistical methods of measurement and comparison. So long as each country existed largely as an independent social and industrial unit, and so long as there was no attempt to make a scientific study of social and economic problems, little need was felt for systematic and detailed statistics. But when students and statisticians began to study social and economic problems scientifically, and as world problems and world movements, they at once found need not only for accurate and detailed national statistics, but also for international statistics, or at least for the data from which such statistics could be compiled. It was soon discovered, however, that not only were the statistics of individual countries often defective, poorly arranged, and lacking in detail, but that the lack of uniformity in the classification of the statistics of the different countries was so great as to all but preclude any comparisons. In fact, to-day, any comparison of the statistics of two countries must be offered with an apology and an explanation; and only the trained statistician is safe in attempting to make such a comparison. Dr. Robert Giffen has shown how difficult it is to make any international comparison of the statistics on such important subjects as education, crime, sexual morality, drunkenness, bankruptcy or insolvency, diffusion of property, agricultural production, manufacturing production, imports and exports, wages, and aggregate wealth.*

Although the great need of uniformity in the classification of national statistics is now generally recognized,† little has been done to bring about such uniformity in the classification of occupation statistics. The only effort of importance along this line is that fathered by Dr. Jacques Bertillon. It has for its object the general adoption and use by the nations of an international classification of occupations. Doctor Bertillon, as far back as 1889, at the session of the International

* Pub. Am. Statist. Ass'n., 1892, Vol. III, pp. 199–212.

† "Half the value of a census is wantonly wasted unless it is so planned that there can be read out of it not only the facts that concern the nation taking it, but the meaning of those facts when interpreted by the experience of others."—S. N. D. North, Pub. Am. Statist. Ass'n, 1908.

Institute of Statistics in Paris, submitted outlines of a system for the uniform classification of occupation statistics, and placed before the next session (Vienna, 1891) a completely worked out "international occupation scheme." This scheme, with some changes made to render it more agreeable to more than a score of directors of the leading statistical bureaus of Germany, Austria-Hungary, Belgium, France, Great Britain, Italy, Norway, and Sweden, to whom it had been submitted for criticism, was adopted by the Institute at its session in Chicago in 1893.*

Doctor Bertillon's classification contains, under its 4 categories, 12 general divisions, subdivided into 61 groups of related industries or related occupations. Of these 61 groups, as many as practicable are further subdivided into industries or groups of occupations, making 207 such divisions. Finally, as many as practicable of these 207 divisions are again subdivided, usually according to occupation, making a total of 500 such subdivisions.

Considering the enthusiasm with which this scheme for an international classification of occupations was launched by its author, its hearty acceptance by the International Institute of Statistics, the approval given it by the directors of many of the leading statistical bureaus of the world, and its superiority over the classifications then in use, until the last few years, it seems to have had less effect in practice than might have been expected and to have been discussed less by statistical and economic writers. A commission appointed to study methods for a census of occupations in France recommended that the classification adopted by the International Institute of Statistics be adopted for the census of 1896, but the advice of the commission was not followed. Two letters from Doctor Bertillon—dated December 18, 1909, and June 8, 1910, respectively—inform us that more interest is being taken in his classification at the present time. Prior to the date of his last letter, it had been adopted by Egypt for its last census (1907 and for its next, by Bulgaria for its last census (1900) and for its census of 1910, by Spain for its last census and for its census of 1910–1911, by Mexico for its census of 1910, by Venezuela for its census of 1910, by Brazil for its census of 1910,

* Bulletin de l'Institut International de Statistique, 1895, Tome 8, p. 226.

and by Chile for its next census. So far as learned, no other countries up to the present have seen fit to adopt the international classification.*

It is generally agreed that many of the existing national classifications of occupations are inadequate, illogical, and unscientific, and that, because of the great differences in the classifications used, as a rule accurate comparison of the statistics of two countries is not only impossible, but cannot be rendered possible by any slight modifications in their classifications. Would it be advisable, then, for the other nations to follow the lead of Italy, Egypt, Bulgaria, Spain, Mexico, Venezuela, Brazil, and Chile, and adopt the international classification?

The present world movement for international uniformity of regulations and legislation on subjects of international interest, and the present movement for the international co-operation and uniformity of methods of scientific and other learned societies shows us that, in all probability, sooner or later, international uniformity in the form of reporting national statistics will come. But it is still an open question whether, at that time, Doctor Bertillon's scheme for the classification of occupations will be the one adopted. While it is the best existing example of the occupational form of classification and a great improvement over the classifications now generally in use, it is not without its defects. In many respects it is a classification by industries rather than by occupations. Especially in the principal ones of its general divisions—"Agriculture," "Extraction of Minerals," "Manufacture," "Transportation," and "Trade,"—frequently the workers are classified according to what they make, rather than according to what they do—according to the *product* to which their services contribute, rather than according to the particular processes which they perform. For example, in the first general division of this classification, "Agriculture," it would be well to report the employees separately from the employers more than is done, and occupational designations might well be substituted for the terms "Fresh-water fish," and "Game." In the second general division, "Extraction

* In their meeting of 1910, the French members of the International Institute of Statistics passed a resolution approving Doctor Bertillon's classification, unanimously and without discussion.

of Minerals," the name of the minerals extracted, as "Coal," "Anthracite," "Peat," etc., are given throughout, and in no case the actual occupations of the workers, as blasters, laborers, foremen, etc. In the third general division, "Manufacture," sometimes occupations, as spinners, weavers, feather dressers, etc., are given, but in about two fifths of the cases only the names of the materials worked upon, as "Jute," "Laces," "Ivory," "Crockery," etc., are given. In the fourth general division, "Transportation," occupational designations are given, except in the cases of "Post," Telegraph," and "Telephone," but that these designations are not as detailed as might be desired is exemplified by the all-inclusive designations, "Ship owners and their employees, ship brokers," and "Railroad, directors, employees, workmen, agents of every sort." In the fifth general division, "Trade," generally occupations are given, but these are not as detailed as it is desirable to report them, and the general term, "Insurance companies of different kinds," is used in lieu of the individual occupations of the persons engaged in that business. In the sixth general division, "Public Force," the terms "Land Army," "Navy," "Gendarmery," and "Police," are used without further subdivision. Likewise, in the seventh general division, "Public Administration," all the numerous government officials, clerks, etc., are bunched together under the one general heading, "Service of the State." And in the eighth general division, "Liberal Arts," while in the main occupations are given satisfactorily, we find this rather too inclusive designation: "Professors [including teachers] of any title whatever in educational institutions maintained by the state, province, commune (primary schools, colleges, universities, etc.)."

Thus, the international classification is not a classification strictly according to occupations, or the kinds of work done but is partly occupational and partly industrial. This lack of consistency is a grave defect in any form of classification which purports to be a model for international adoption and use. It is a defect, however, which could be remedied by changes in Doctor Bertillon's "third classification"—the substitution of occupations for the materials worked upon—without destroying his general plan. With these changes, the

scheme would be an excellent one, and one that might well be adopted generally. In main outline it is far superior to many of the classifications now in use; and, with a proper classification of occupations under its twelve general divisions, it would give an excellent picture of the occupational distribution of the population of a country.

V. Occupation Classification in the United States.

Coming, now, to the United States, we find that it has not been an exception to the general rule. Until recent years there was the same negligent attitude toward occupation statistics that was prevalent among European nations. While the first federal census of occupations was taken in 1820, it was not until 1870 that anything of importance was done in the way of classifying occupations, and it was not until 1890 that the statistics of occupations could be said to be fairly reliable. The amount of space given to occupation statistics and their analysis in the reports of the censuses, prior to that of 1890, was comparatively small. In the reports of the census of 1890, more attention was given the subject, and in the reports of the census of 1900 a special volume of over 1,000 pages was devoted to "Occupations."

But notwithstanding the increased prominence given to occupation statistics at the census of 1900, they have failed to satisfy the rapidly increasing demands of the students of labor, social, and other problems for more accurate and detailed information about the occupations of the people. In order better to satisfy this demand, special attention is being given the subject of occupation statistics and their classification at this census (1910). At each preceding census, such a large percentage of the occupations were returned indefinitely that detailed classification was impossible. This was due partly to the fact that, although, in 1890 and again in 1900, the enumerator was expected to state both the kind of work done and the general nature of the business or industry, but a single column on the schedules was provided for the return of occupations. At this census (1910) two columns were provided for this purpose.* The instructions to enumerators were re-written and made more definite and more emphatic.

* An improvement made by Switzerland in 1880.

The classification, changed but little since 1890, and never satisfactory, was made the subject of special study.

A little study showed that the classification of occupations in the census of the United States needed a thorough overhauling. The classification of occupations in the Twelfth Census is practically that of the Eleventh Census, with some further division into minor occupation groups. In writing of the classification of occupations in the Eleventh Census Mr. Henry Gannett says:*

"There is probably no subject connected with the census concerning which there seems to be less clearness of purpose or plan than the classification of occupations. What the purpose of the statistics of occupations is, or the character of the information which such statistics are designed to present, is not made clear by any existing classifications." And, notwithstanding the attempt made in 1900 "to classify occupations with respect to the kind of work done or character of service rendered, rather than according to the article made or worked upon, or place where the work was done," Prof. John Cummings, writing in the *Journal of Political Economy*,† says of the classification of occupations in the Twelfth Census:

"It has often been pointed out that the general classification is, nevertheless, one by industries, and it will appear from an examination of the specific designation within these larger groups that the classification by industry, rather than by character of work, is carried out to considerable detail. These two principles of classification are obviously conflicting, and the resultant grouping is in consequence one of little significance; it is neither one of trades, crafts, or occupations, on the one hand, nor by industries, on the other, whether this is due to the inherent difficulty of applying universally any single principle of classification or not, it is certainly unfortunate, and vitiating."

Under the present classification, workers of various degrees of skill, or workers in occupations where the degree of healthfulness and safety varies much, often are grouped together merely because they work in the same industry. Thus, often, it is a classification by industries, rather than by grades of

* Pub. Am. Statis. Ass'n, 1894, Vol. IV, p. 12.

† Vol. II, p. 192.

workmen or kinds of work. For example, the most skilled glass blower is grouped with the laborers of the glass industry; the mine foreman and the ignorant and unskilled mine laborer are put in the same class; 203,220 "Iron and steel workers" are all grouped together regardless of the difference in skill and in healthfulness in the different occupations. Here are a few of the many other examples of unscientific grouping: the miller and the laborer about the mill; the highest and the lowest grades of saw and planing mill employees (150,612); all classes of piano and organ makers; the employees in many kinds of "not specified" woodworking industries; all the "Watch factory operatives"; the many occupations (nearly 100 were returned in the 1910 schedules) followed by the 246,391 cotton mill operatives; and all the occupations followed by the 73,196 woolen mill operatives.

The classification followed in the census of 1890 may have been the best practicable one for the United States at that time, and the statistics reported under it may have satisfied in a large degree the demands made upon the government for statistics of occupations; but it is believed that it is not the best practicable classification for the United States today, and it is certain that the statistics that could be reported under it would not meet the present demands on the government for statistics of occupations.

While it is generally agreed that a new and more detailed classification of occupations is necessary, it is not agreed as to what the form of the new classification should be. Some say we should give up the present form of classification, which, largely, is one by industries, and base the new classification principally on skill. Others contend that the new classification should be one of occupations only, and that no particular attention should be paid to industries or to skill.

A division of the gainful workers of the nation on the basis of skill and intelligence would go far toward showing the occupational station in life of each of them. In many respects such a classification would be an admirable and a useful one, but it is not without its difficulties and defects. Since there is no agreement as to which occupations are skilled, the person making a detailed classification according to skill must be acquainted with the skill required in each of the numerous

occupations in each of the various industries. No man, from his own experience, has such an acquaintance. To familiarize himself with the skill required in each of the occupations in each industry would be a very long and arduous, if not impossible, task.

A rough classification based on skill alone would be possible, but, aside from the practical difficulties already mentioned, which would be encountered in any attempt to carry it out, it has a number of grave defects. If, for example, all industrial and occupational distinctions were done away with and all the workers were grouped according to skill, regardless of the industries in which they worked or the specific kind of work they performed, it would be impossible to tell whether, with a given mortality rate for factory operatives, the operatives in all factories and in all factory occupations had the same mortality rate, or whether the rate was much higher in certain factories and in certain occupations than in others. But, by reporting in detail all the different occupations in each industry, any high rate due to exceptionally bad conditions in one industry or in one occupation could be traced to its source quickly. Again, while the skill and intelligence of all farm laborers may, in the main, be the same, yet the healthfulness of the occupation of the "cranberry-bog laborer" may be far different from that of the poultry-yard laborer or the vineyard laborer. The healthfulness of an occupation and the skill required in its pursuit have no necessary relation to each other.

A classification of workers according to their respective occupations would, in many respects, be a satisfactory one, since it would furnish the statistician or other student with data capable of being reclassified to suit his special purpose. But it is evident that, in practice, we could not follow a classification according to occupation alone, for the occupations are far too numerous, the distinctions between them frequently are too loose, and the returns of the enumerators are too imperfect. Since all the occupations in the cotton industry, for example, cannot be reported separately, how would those grouped together be reported if not as "Other workers in the cotton industry"?—thus, of necessity, resorting to an industrial classification.

Not only is it now impossible to report separately each of

the specific occupations in each industry, but this is becoming and will continue to become increasingly difficult as the number of our industries increases and as the division of labor in each industry becomes more and more minute. Even could the specific occupations be reported separately, often the number of persons in each occupation would be so small as to preclude generalization.

Since, then, it does not seem wise to ignore industries entirely and make a classification based alone or mainly on skill; since it is impossible, because of the large number of occupations and the insufficiency of the returns, to carry out a complete classification based on occupation only; and since it seems to be neither wise nor practicable to break away entirely from the industrial form of classification and thus render impossible the study in detail of the occupations in individual industries, and the comparison of Thirteenth Census occupation statistics with the occupation statistics of past censuses—since these things seem to be true, what form of classification should we adopt? Will it not be best to adopt a classification based principally upon occupation, and, so far as possible, still retaining the present industrial form? Can we not in this way retain what is best and essential in each method of classification and at the same time avoid such revolutionary changes as would render comparison with our past statistics impossible?

In the belief that an occupational classification, with an industrial framework, is the best form, a tentative scheme for such a classification has been formulated by the Bureau of the Census. The general outline of this classification—the industrial frame-work—is given below. The detailed manner in which the occupations in each industry are classified is shown later.

(A) EXTRACTIVE INDUSTRIES.

I. AGRICULTURE, FORESTRY, AND ANIMAL HUSBANDRY:
- Agriculture
- Forestry
- Animal husbandry

II. EXTRACTION OF MINERALS:
- *Mining.*
  - Coal mines
  - Copper mines

Gold and silver mines
Iron mines
Lead and zinc mines
Other mines
Mine workers (mine not specified)
Quarrying.
Quarries (stone, cement, sand, clay, etc.)
Production of salt, oil, and natural gas.
Production of salt
Production of oil and natural gas

(B) Industries of Transformation, Transportation, and Trade.

III. MANUFACTURING AND MECHANICAL INDUSTRIES:
Building trades.
Building and hand trades
Chemicals and allied products.
Fertilizer makers
Paint makers
Powder, cartridge, dynamite, fuse, and fireworks makers
Soap makers
Other chemical workers
Clay, glass, and stone products.
Brickmakers
Potteries
Tile makers
Glass
Terra-cotta workers
Lime, cement, and gypsum
Marble and stone cutters
Clothing.
Clothing makers (suits, coats, cloaks, and overalls)
Clothing makers (other than suits, coats, cloaks, and overalls)
Corset makers
Glove makers
Hat makers (wool or felt)
Shirt, collar, and cuff makers
Food and kindred products.
Bakeries
Butter and cheese makers
Candy
Fish curers and packers
Flour and grain mills
Fruit and vegetable canners, picklers, and preservers
Slaughter and packing houses
Sugar makers and refiners
Other food preparers

Iron and steel and their products.
- Agricultural implements
- Automobile factories
- Car and railroad shops
- Foundries and metal working
- Iron and steel mills
- Ship and boat building
- Wagons and carriages
- Other iron and steel workers

Leather and its finished products.
- Harness and saddle makers and repairers
- Leather belt, leather case, and pocketbook makers
- Shoes
- Tanneries
- Trunk makers

Liquors and beverages.
- Breweries
- Distilleries
- Other liquor and beverage workers

Lumber and its remanufacture.
- Box makers (wood)
- Furniture
- Pianos and organs.
- Saw and planing mills
- Other woodworkers

Metals and metal products other than iron and steel.
- Brass mills
- Clock factories
- Copper factories
- Gold and silver workers
- Jewelry factories
- Lead and zinc factories
- Tin-plate factories
- Tinware factories
- Watch factories
- Other metal workers

Paper.
- Box makers (paper)
- Makers of blank books, envelopes, tags, paper bags, etc.
- Paper mills
- Pulp mills

Printing and bookbinding.
- Printing and publishing establishments

Textiles.
- Carpet mills
- Cotton mills
- Dyeing and finishing textiles
- Hemp and jute mills

Knitting mills
Lace and embroidery makers
Linen mills
Print works
Rope and cordage factories
Sail, awning, and tent makers
Silk mills
Woolen mills
Worsted mills
Not specified textile workers

Miscellaneous industries.

Broom and brush makers
Button makers
Charcoal and coke burners
Cigars
Electric light and power companies
Electrical supplies
Gas works
Oil works
Rubber factories
Straw workers
Tobacco
Turpentine distillers
Other miscellaneous industries and occ
Workers in "Not specified" manufacturing and mechanical industries

IV. TRANSPORTATION:

Water transportation.

Water transportation

Road, street, and bridge transportation.

Construction and maintenance of streets, roads, sewers and bridges
Livery stables
Truck, transfer, cab, and hack companies
Street railways

Transportation by railroad.

Transportation by railroad

Express companies.

Express companies

Post, telegraph, and telephone.

Post
Telegraph and telephone

Other persons in transportation.

Other persons in transportation.

V. TRADE:

Banking and brokerage
Insurance
Real estate
Wholesale and retail trade

Elevators
Stock yards
Warehouses and cold-storage plants
Other persons in trade
Clerical assistants (industry, business, or profession not specified)

(C) SERVICE.

VI. PUBLIC SERVICE (NOT ELSEWHERE CLASSIFIED):
Public administration.
Federal officials and employees
State officials and employees
County officials and employees
City or town officials and employees
Public defense and maintenance of law and order.
National defense
(*a*) Army
(*b*) Navy
Maintenance of law and order
United States marshals
County sheriffs
City marshals
Constables
Detectives
Guards in parks, prisons, public institutions, and public buildings
Policemen
Probation and truant officers
Watchmen

VII. PROFESSIONAL SERVICE:
Professional service

VIII. DOMESTIC AND PERSONAL SERVICE:
Occupations not in industries
Laundries and laundry work

Under the three main categories of the proposed classification, there are eight general divisions. The grouping of the occupations of the people of a country under a few main heads is not without purpose or without advantages. Such a division enables one to study the workers and their occupations by large groups—to study groups the workers in each of which labor under somewhat similar conditions and in a somewhat similar environment, and have a similar station in life. It enables one to study, for example, the proportion of the workers of a country in each of these main industrial divisions, and the fluctuations in these proportions. This arrangement is very important also for the reason that, for

purposes of general study and general statement, it is possible to deal with large groups only. Therefore, it is well to preserve these main divisions, but they should not be allowed to interfere materially with the more important logical and practicable grouping of individual industries or occupations.

The number of main divisions in a classification should be determined largely by the natural groups into which the workers fall because of the similarity of their occupations, environment, station in life, and the industries in which they work. This number should not be so large—as it is in the English classification, which has twenty-three main divisions —as to preclude any brief and general statements as to large occupational groups; and it should not be so small—as heretofore in the United States classification—as to render accurate general statements impossible because each main division contains distinct natural groups.

In the United States classification there is need of a larger number of general divisions.* Our classification has been rendered illogical, unscientific and inadequate by the attempt to force all occupations and industries into five general divisions. In the proposed new classification an effort has been made to remedy this defect by increasing the number of general divisions from five to eight.

The title of the first division of the old classification, "Agricultural Pursuits," has been expanded to "Agriculture, Forestry, and Animal Husbandry," and the fishermen and oystermen have been transferred from "Manufacturing and Mechanical Pursuits" to this division.

The workers in the mining industries formerly were grouped with those engaged in agricultural pursuits, although the character of the work, and the environment of the workers and their station in life are quite different in the two cases. Later, they were transferred to the division of "Manufacturing and Mechanical Pursuits," not because they belonged there but because they must be put somewhere and they seemed to fit there a little less poorly than in the division "Agricultural Pursuits." This distinct group of workers, after having been tossed about for all these years, has at last found a home in the new division, entitled "Extraction of Minerals."

*Heretofore the United States classification has had fewer general divisions than have the classifications of most of the other leading nations.

Since 1870 one of the five general divisions in the United States classification has been "Trade and Transportation." Whether, in 1870, there was any valid reason for joining trade and transportation is doubtful. Today, it is certain that, aside from the pleasing alliteration, there is no more reason for joining trade and transportation than there is for joining trade and manufacture. In fact, it is highly probable that manufacturers are engaged in trade to a much greater extent than traders are engaged in transportation. Every manufacturer of products, whatever, is also a merchant to the extent of selling his own products. Not only is transportation a distinct division of our present-day industrial system, but, also, the occupations of the workers in it are quite distinct from the occupations of the workers engaged in trade. The proposed classification makes a separate division of transportation.

In the old classification, all public officials—national, state, county, and city or town—from the president to the most petty township officer, are grouped with professional classes, regardless of the fact that neither the official duties nor the intellectual attainments of large numbers of them entitle them to be called professional men. And, according to the census, all the men in our army and navy—employed mainly in national defense,— and all watchmen, policemen, and detectives—employed mainly in local defense—are engaged in personal and domestic service, notwithstanding the fact that their service is mainly public. In fact, "Domestic and Personal Service" has been made a dumping ground for "the odds and ends" of occupations which do not easily fall into any other class. Among others, we find here, 9,373 "Laborers (coal-yard)," 2,588,283 "Laborers (general)," 20,934 "Longshoremen," and 9,139 "Stevedores."

In order to relieve "Professional Service" and "Domestic and Personal Service" of some of these incongruent groups, and in order to bring together all those persons engaged in government service, and not elsewhere classified, the new division, "Public Service," was made.

Under the 8 general divisions of the classification outlined are arranged 123 industries and 4 service groups. In the further development of the classification, the method was to treat each industry, or each service group, as a separate unit,

and to give separately each of the important occupations under it. After enumerating all the important occupations in an industry, a class—entitled "Other Occupations"—was made for the unimportant occupations which, although definitely returned, are not sufficiently important to justify classifying each of them separately. At the end of each industry a class—entitled "Not Specified"—was made for all occupational returns in which the industry is given, but the particular occupation followed by the person is not specified. As an illustration of the manner of classifying the occupations of each of the 123 industries, and of each of the 4 service groups, the classification for one industry, "Printing and Publishing Establishments," is given below.

PRINTING AND PUBLISHING ESTABLISHMENTS.

Publishers and proprietors.
Officials.
Managers and superintendents.
Foremen and overseers.
Advertising and printing agents.
Bookkeepers.
Cashiers.
Clerks.
Collectors.
Purchasing agents.
Stenographers.
Typewriters.
Apprentices.
Bookbinders.
Compositors, printers and typesetters.
Cutters.
Decorators.
Designers.
Electrotypers and stereotypers.
Elevator tenders.
Embossers.
Engineers (stationery).
Engravers.
Errand and office boys.
Finishers (bindery).
Firemen.
Fitters.
Folders.
Gatherers.
Gilders.
Gold layers.
Helpers.
Inspectors.
Janitors.
Laborers.
Linotypers.
Lithographers.
Machinists.
Mechanics.
Numberers and pagers.
Pasters.
Porters.
Press feeders.
Pressmen.
Proofreaders.
Rulers.
Sewers and stitchers.
Shipping clerks.
Sorters.
Trimmers.
Wrappers.
Other occupations.
Not specified.

This form of classification seems to be a possible one, and one which will admit of reporting separately as few or as many

occupations in each industry as seems desirable and practicable. It is a form that will allow of expansion or contraction to suit changes in occupations and industries. If an occupation now relatively insignificant becomes of great importance, or if an occupation now healthful becomes, with changed processes, unhealthful, it can be reported separately, and those occupations which are of no special importance because of the skill, numbers, unhealthfulness, etc., of the workers, and which are too numerous to be reported separately, can be grouped together under the industry. If an important industry springs up it can be given a place under the proper general division; and, if thought best, new general divisions can be added.

The form of classification to be followed in the forthcoming census report on occupations can be determined, finally, only after the occupation returns are fully tabulated and the Bureau of the Census finds what it has to report; but it is probable that the tentative classification outlined in this article, modified somewhat perhaps, will be followed. Important changes in the census classification of a nation should be made only after careful and thorough consideration; and every such change should be thoroughly justified before being made. So far as practicable, comparability with past censuses should be preserved; and, where it can be done, the classification should be made to conform to the classifications of other nations. The object should be to make a classification that will be permanent, and one that probably will conform to an international classification in case one is adopted. It is especially important that consideration be given to the probable future industrial development of the country, and to the consequent probable increased demands that will be made upon any form of classification adopted. In the United States, it is evident that there will be a rapid and great increase in the number of our industries and the occupations of our working people. It is evident, also, that in the near future, either we must issue voluminous reports on occupations or else, in one form or another, report large groups of workers together. Whether, in view of all these things, the form of classification given here is the best possible one, is a question that should be considered. Will this form of classification meet the present and the probable future needs of users of occupation statistics;

and will it be adequate after the further development of our industries and the further division of labor?

Another question that must be settled before the report on occupations is written is this: In case this proposed form of classification is adopted, in how great detail should the Bureau of the Census report occupations? As stated in the beginning of this article, great detail of occupation is necessary to the intensive study of many of the problems relating to children, women, immigrants, negroes, etc., and, for the proper study of the questions of health, accident rates, insurance rates, etc., among the employed, such detail is indispensable. It is impossible for a national government to report its statistics in just the form each person may desire to use them; but if its statistics are reported in great detail, anyone can regroup them to suit his own purpose. An intensive study of the occupations in any industry is made possible by reporting them in detail. Finally, the more fully the occupations of a country are reported the easier will be comparison of its statistics with those of other countries, and, also, with its own past statistics, after changes in its classification have been made. On the other hand, space-limits prevent reporting the statistics in detail in many tables. In the forthcoming report on occupations, would it meet the need for greater detail to give one table for the United States, showing each industry with each occupation pursued in the industry, and with the workers in each of these occupations classified according to sex, nativity and age groups (the occupations to be grouped for the other tables)?

In its next report on occupations, the Bureau of the Census desires to supply, so far as practicable, such occupation statistics as students and statisticians will need in the study of the various problems in which they are interested. But, in order for it to do so, it must know their needs. One purpose of this article is to place the subject of occupation statistics and their classification before the users of such statistics, in the hope that in this way their valuable co-operation may be secured. It is only through the co-operation of the Bureau and the users of its statistics that the highest results can be attained. Criticisms and suggestions made now can and will be carefully considered by the Bureau of the Census. Those which may be brought forward after the publication of the report cannot receive due attention until 1920.